

REMARKS

The Examiner's recognition of Applicants' invention by the indication of allowable subject matter for claim 3-6 and 12-13 is gratefully acknowledged.

Claim 1 is amended to call for a Ti content for the filler metal between 1.0 and 1.5%, a range previously recited in claim 3. Claim 8 is amended to call for a filler metal composition similar to claim 1. Claim 24 is amended to call for a composition of the stainless steel weld material similar to claims 1 and 8. Claims 3 and 12 are amended to eliminate redundancy.

Claim Rejection based upon prior art

Claims 8-10 and 14-27 were rejected under 35 U.S.C. § 102(b) or 103 as anticipated by or unpatentable over Japanese patent document 358174554 (JP '554) or Japanese patent document 356105456 (JP '456) or United States Patent No. 6,159,310, issued to Inoue et al. in 2000. Claim 1, 2, 7 and 11 were rejected under 35 U.S.C. § 103 as unpatentable over JP '554 or JP '456 or Japanese patent document 2000094182 (JP '182) or Inoue et al. or United States Patent No. 6,770,394, issued to Bressanelli in 1973.

JP '554 describes a steel having a composition that satisfies a very complex formula based upon the concentration of 12 elements. The steel contains not more than 0.3% Ti. Table 1 lists only a single example having a Ti addition, sample D, wherein Ti

is 0.15%. In contrast, Applicants' filler metal contains significant Ti, preferably between 1.0 and 1.5%. It is significant that the Applicants' filler metal is particularly suited for welding 409 stainless steel, and so provides a Ti content comparable with 409 stainless steel to enhance the compatibility of the filler and the base metal, see paragraph 0024. JP '554 does not disclose a steel having a Ti content compatible with 409 stainless steel, and so does not teach or suggest Applicants' invention.

JP '456 describes a base metal that forms the structural component upon which the welding process is carried out, as opposed to a filler metal that is fused to the base metal in forming a weld, as in Applicants' invention. Moreover, the steel has a Ti content of 0.05 to 0.35%. This is significantly lower than the filler metal of Applicants' invention, which is intended to be compatible with 409 stainless steel. Thus, JP '456, like JP '554, does not teach or suggest Applicants' filler metal.

Inoue et al. describes a filler metal that contains only small amounts of Ti. Table 1 presents examples with Ti contents between 0.02 and 0.05. This is substantially lower than the Ti content in Applicants' filler metal. Thus, Inoue et al. does not teach or suggest Applicants' filler metal.

JP '182 describes a filler material for martensitic stainless steel. The Ti content of the filler material is between 0.01 and 0.03%. In contrast, Applicants' filler metal is adapted for use with ferretic stainless steel, such as 409, and so is formulated to have a Ti content compatible with 409 stainless steel. JP '182 does not teach or suggest a Ti

content compatible with 409 stainless steel, and so cannot teach or suggest Applicants' invention.

Whereas Applicants' invention is directed to a filler metal, Bressanelli describes a steel structure welded without filler metal, col. 3, lines 20. As disclosed in Bressanelli, the minimum Ti content is 0.10%. The maximum is 6 times the carbon content. The maximum carbon is 0.08%, so the maximum Ti content contemplated by Bressanelli is 0.48%, substantially less than Applicants' filler metal. Thus, Bressanelli does not teach or suggest Applicants' filler metal.

Applicants' invention provides a filler metal that is adapted for welding 409 stainless steel and forms a martensitic structure to offset shrinkage that would otherwise occur during cooling and cause distortion, thereby providing a more robust weld. This is accomplished in part by providing a Ti content effective to offset the effects of dilution, see paragraph 0025, while nevertheless producing the desired martensitic structure. None of the references show a filler metal for a weld with a Ti content effective to offset the dilution effect and produce a martensitic structure. Thus, the references, separately or combined, do not point the practitioner to the filler metal that is Applicants' invention.

Claim 1 is directed to Applicants' filler metal effective to form a microstructure comprising martensite. The filler metal is characterized by a composition that includes about 1.0 to 1.5% Ti. Applicants have found that steel with the recited Ti content, in combination with the other recited metals, is effective to produce the desired martensitic

microstructure. The references all disclose steels having significantly lower Ti concentrations, and so do not show that a filler metal having higher Ti is effective in forming a weld joint having the desired martensitic microstructure. Thus, none of the references teach or even suggest Applicants' filler metal in claim 1.

Claims 2 and 7 are dependent upon claim 1 and so not taught or suggested by the references at least for the reasons set forth with regard to that claims.

Claim 9 is directed to Applicants' method of attaching two components. The method comprises using a filler metal having a composition similar to claim 1. For the reasons set forth above, none of the references teach or suggest using a filler metal having the recited composition and properties. Thus, the references do not teach or suggest Applicants' method in claim 8, or in claims 9-11 or 14-23 dependent thereon.

Claim 24 is directed to a welded stainless steel article that includes a weld joint characterized by 20-60% martensite. The stainless steel weld material comprises a composition based upon the filler metal in claim 1. For the reasons set forth above, none of the references teach or suggest a Applicants' welded article in claim 24 or dependent claims 25-27.

Accordingly, it is respectfully requested that the rejection of the claims under sections 102 and 103 be reconsidered and withdrawn, and that the claims be allowed.

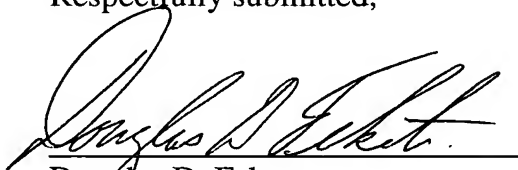
Conclusion

Claim 3-6 and 12-13 were objected to as dependent upon a rejected base claims. In view of the amendments and remarks herein, it is believed that the base claims are now allowable. Accordingly, it is requested that the objection be withdrawn, and that all claims be allowed.

If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Douglas D. Fekete", is written over a horizontal line.

Douglas D. Fekete
Reg. No. 29,065
Delphi Technologies, Inc.
Legal Staff – M/C 480-410-202
P.O. Box 5052
Troy, Michigan 48007-5052
(248) 813-1210